

WHAT IS CLAIMED IS:

1. A non-linear optical material comprising a bismuth film capable of producing non-linear optical effects including non-linear refraction and non-linear absorption.

2. The non-linear optical material of claim 1, wherein the bismuth film is  
5 formed by pulsed laser deposition.

3. The non-linear optical material of claim 1, wherein a thickness of the bismuth film is approximately 10.5nm.

4. The non-linear optical material of claim 1, wherein the bismuth film is covered by a top protective layer.

10 5. The non-linear optical material of claim 4, wherein the top protective layer is transparent.

6. The non-linear optical material of claim 4, wherein the top protective layer comprises  $\text{Al}_2\text{O}_3$ .

15 7. The non-linear optical material of claim 1, wherein the bismuth film is disposed on a base layer.

8. The non-linear optical material of claim 7, wherein the base layer comprises glass.

9. The non-linear optical material of claim 7, wherein the base layer comprises quartz.

20 10. The non-linear optical material of claim 1, which is used as a non-linear optical device in an optical method or in an optical apparatus.